Nathan again the withdrawal of claims 1-36 should accommodate the disclaimers. Furthermore while there is an analogous screw conveyor the basic mechanisms for applying heat to the feedstock are entirely different. The Nathan reactor is intended to extract oil from 10 million pounds per hour of tar sands whereas the reactors of this invention are mainly intended to process feedstocks in the 1-100 pounds /hour range and the orders of magnitude differences have a major impact on the nature of the process and the design and structure.

**Claims 1-36 (Cancelled)**

**Claim 37 (New)**

A process for pyrolysis of feedstock comprising a substance selected from the group consisting of biomass wood chips, newspaper, mixed waste paper, peat, energy crops, agricultural residues, coal, tire chips, plastics, and RDF, said process comprising the following steps:

supplying the feedstock into an inner hopper;

introducing the feedstock into, and moving said feedstock through, a reactor tube, the feedstock being moved through the reactor tube by a rotating auger;

heating the feedstock within said reactor tube to a sufficient temperature such that pyrolysis of the feedstock occurs to produce a residual carbonized feedstock;

generating heat within a combustion chamber, wherein the combustion chamber is in direct thermal contact with the reactor tube such that heat generated within the combustion chamber is transferred to the feedstock in the reactor tube through the wall of the reactor tube to provide the heat for pyrolysis; and

collecting the residual carbonized feedstock exiting the reactor tube in a pressure vessel;

wherein the feedstock is introduced into the reactor tube from the inner hopper, said reactor tube comprising an exit orifice, the residual carbonized feedstock exiting the reactor tube via the exit orifice and entering the pressure vessel; and

wherein the pressure generated in the pressure vessel forces the flow of gasses of pyrolysis upward through the reactor tube and through the incoming feedstock in the inner hopper, such that said feedstock in the inner hopper acts as a filter and heat generated in the combustion chamber is transferred to the incoming feedstock within the hopper.

**Claim 38 (New)**

The process for pyrolysis of feedstock in claim 37, further comprising the step of:

injecting a gas into the pressure vessel, the gas being selected from the group consisting of $CO_2$, steam, natural gas, oxygen, and air.

wherein the gas injected into the pressure vessel enhances the conversion of the residual carbonized feedstock exiting the reactor tube via the exit orifice to gasses and/or liquids; and

wherein the flow of the gas injected into the pressure vessel is controlled in order to adjust the conversion of the residual carbonized feedstock into the gasses and/or liquids.

**Claim 39 (New)**

The process for pyrolysis of feedstock in claim 37, further comprising the step of:

introducing feedstock into, and moving said feedstock through, at least one additional reactor tube; and

heating the feedstock within said at least one additional reactor tube to a sufficient temperature such that pyrolysis occurs to produce a residual carbonized feedstock;

wherein the feedstock is introduced into the at least one additional reactor tube from the inner hopper.

**Claim 40 (New)**

A process for pyrolysis of feedstock comprising a substance selected from the group consisting of biomass wood chips, newspaper, mixed waste paper, peat, energy crops, agricultural residues, coal, tire chips, plastics, and RDF, the process comprising the following steps:

supplying the feedstock into an inner hopper;

introducing the feedstock into, and moving said feedstock through, a reactor tube, the feedstock being moved through the reactor tube by a rotating auger;

heating the feedstock within said reactor tube to a sufficient temperature such that pyrolysis occurs to produce a residual carbonized feedstock; the heat for heating the feedstock being generated by a heat source selected from the group consisting of combustion chamber, gas heat, electric coil oven, and electric tube furnace; and

collecting the residual carbonized feedstock exiting the reactor tube in a pressure vessel;

wherein the feedstock is introduced into the reactor tube from the inner hopper, said reactor tube comprising an exit orifice, the residual carbonized feedstock exiting the reactor tube via the exit orifice and entering the pressure vessel; and

wherein the pressure generated in the pressure vessel forces the flow of gasses of pyrolysis upward through the reactor tube and through the incoming feedstock in the inner hopper, such that said feedstock in the inner hopper acts as a filter and heat generated by the heat source is transferred to the incoming feedstock within the inner hopper.

**Claim 41 (New)**

The process for pyrolysis of feedstock in claim 40, further comprising the step of:

injecting a gas into the pressure vessel, the gas being selected from the group consisting of $CO_2$, steam, natural gas, oxygen, and air;

wherein the gas injected into the pressure vessel enhances the conversion of the residual carbonized feedstock exiting the reactor tube via the exit orifice to gasses and/or liquids; and

wherein the flow of the gas injected into the pressure vessel is controlled in order to adjust the conversion of the residual carbonized feedstock into the gasses and/or liquids.

**Claim 42 (New)**

The process for pyrolysis of feedstock in claim 40, further comprising the step of:

introducing feedstock into, and moving said feedstock through, at least one additional reactor tube; and

heating the feedstock within said at least one additional reactor tube to a sufficient temperature such that pyrolysis occurs to produce a residual carbonized feedstock;

wherein the feedstock is introduced into the at least one additional reactor tube from the inner hopper.

**Claim 43 (New)**

A device for pyrolysis of feedstock, comprising:

an inner hopper for supplying a feedstock;

a reactor tube within which pyrolysis of the feedstock occurs;

a means for introducing feedstock into, and moving the feedstock through, the reactor tube, said means for introducing and moving the feedstock comprising a rotating auger;

a means for heating the feedstock within said reactor tube to a sufficient temperature such that pyrolysis occurs to produce a residual carbonized feedstock, said means for heating

comprising a heat source selected from a group consisting of combustion chamber, gas heat, electric coil oven, and electric tube furnace; and

a pressure vessel positioned to collect the residual carbonized feedstock exiting the reactor tube;

wherein the feedstock is introduced into the reactor tube from the inner hopper, said reactor tube comprising an exit orifice, said residual carbonized feedstock exiting the reactor tube via the exit orifice and entering the pressure vessel; and

wherein the pressure generated in the pressure vessel forces the flow of gasses of pyrolysis upward through the reactor tube and through the incoming feedstock in the inner hopper, such that said feedstock in the inner hopper acts as a filter and heat generated by the means for heating is transferred to the incoming feedstock within the inner hopper.

**Claim 44 (New)**

The device for pyrolysis of feedstock in claim 43, further comprising:

a means for injecting a gas into the pressure vessel;

wherein the means for injecting a gas into the pressure vessel enhances the conversion of the residual carbonized feedstock exiting the reactor tube via the exit orifice to gasses and/or liquids; and

wherein the flow of the gas injected into the pressure vessel is controlled in order to adjust the conversion of the residual carbonized feedstock into the gasses and/or liquids.

**Claim 45 (New)**

The device for pyrolysis of feedstock in claim 43, further comprising at least one additional reactor tube;

wherein the feedstock within said at least one additional reactor tube is heated to a sufficient temperature such that pyrolysis occurs to produce a residual carbonized feedstock; and

wherein the feedstock is introduced into the at least one additional reactor tube from the inner hopper.

**Claim 46 (New)**

A device for pyrolysis of feedstock, comprising:

an inner hopper for supplying a feedstock;

a reactor tube within which pyrolysis of feedstock occurs;

a means for introducing feedstock into, and moving the feedstock through, the reactor tube, said means for introducing and moving the feedstock comprising a rotating auger;

a combustion chamber positioned such that the combustion chamber is in direct thermal contact with the reactor tube such that heat generated within the combustion chamber is transferred to the feedstock in the reactor tube to provide heat of pyrolysis to produce a residual carbonized feedstock; wherein the feedstock is introduced into the reactor tube from an inner hopper, and wherein gasses of pyrolysis travel through the feedstock in the inner hopper such that feedstock in the inner hopper acts as a filter; and

a pressure vessel positioned to collect the residual carbonized feedstock exiting the reactor tube;

wherein the feedstock is introduced into the reactor tube from the inner hopper, said reactor tube comprising an exit orifice, said residual carbonized feedstock exiting the reactor tube via the exit orifice and entering the pressure vessel; and

wherein the pressure generated in the pressure vessel forces the flow of gasses of pyrolysis upward through the reactor tube and through the incoming feedstock in the inner hopper, such that said feedstock in the inner hopper acts as a filter and heat generated by the combustion chamber is transferred to the incoming feedstock within the inner hopper.

**Claim 47 (New)**

The device for pyrolysis of feedstock in claim 46, further comprising:

a means for injecting a gas into the pressure vessel;

wherein the means for injecting a gas into the pressure vessel enhances the conversion of the residual carbonized feedstock exiting the reactor tube via the exit orifice to gasses and/or liquids; and

wherein the flow of the gas injected into the pressure vessel is controlled in order to adjust the conversion of the residual carbonized feedstock into the gasses and/or liquids.

**Claim 48 (New)**

The device for pyrolysis of feedstock in claim 46, further comprising at least one additional reactor tube;

wherein the feedstock within said at least one additional reactor tube is heated to a sufficient temperature such that pyrolysis occurs to produce a residual carbonized feedstock; and

wherein the feedstock is introduced into the at least one additional reactor tube from the inner hopper.